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BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
12400 WILSHIRE BOULEVARD
7TH FLOOR
LOS ANGELES, CA 90025

EXAMINER

GARCIA, JOANNIE A

ART UNIT

PAPER NUMBER

2823

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 19

Application Number: 09/476,633

Filing Date: 12-31-1999

Appellant(s): WANG ET AL

Thomas J. Treutler
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 05-20-2002.

(1) Real Party in Interest

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A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-4, and 6-28 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) ClaimsAppealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,159,858

Kishii et al

12-2000

(10) Grounds of Rejection

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-5, 7, 9-12, 15, 18, 19, and 26-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Kishii et al (U.S. Patent 6,159,858).

Kishii et al discloses a method of removing a particle from a surface of a metal plug 44b formed in a via 43a comprising introducing a first agent to a W, Cu, or Al metal layer, CMP polishing the metal layer with the first agent, after polishing the metal layer, introducing a second agent comprising hydrogen peroxide to rinse the surface of the metal plug, and removing at least one particle from the surface of the metal plug. Kishii et al teaches as well, that polishing the metal layer comprises polishing with the first agent having a silica abrasive material. Kishii et al also teaches that introducing the second agent occurs after the operation of polishing the metal layer and the substrate. Kishii et al is also disclosing polishing the substrate with the second agent. Kishii et al is teaching as well, removing at least one particle from a surface of a metal plug 44b disposed over a substrate 41 comprising depositing a slurry onto a metal layer over the metal plug, polishing the metal layer, and after polishing the metal layer, rinsing the surface of the metal plug with a solution comprising hydrogen peroxide. Kishii et al also teaches that rinsing the metal plug occurs after polishing the metal layer and substrate. Kishii et al is teaching as well, polishing a metal layer over a conductive plug 44b with a slurry, after polishing the metal layer, introducing a rising solution onto the conductive plug, the rinsing solution comprises hydrogen peroxide. Kishii et al teaches as well, further including polishing the metal layer with an abrasive material, wherein the rinsing solution is introduced after polishing of the substrate. (Figures 11C-11E, Column 4, lines 3-7, Column 9, lines 5-20, Column 10, lines 8-11, and 60, Table II, Column 13, lines 58-67, Column 14, lines 53-59).

Claims 6, 8, 13, 14, 16, 17, and 20-22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishii et al as applied to claims 1-5, 7, 9-12, 15, 18, 19, and 23-28 above, and further in view of the following comment.

With regard to claims 6, 8, 13, 14, 16, 17, and 20-22, it would be a matter of routine optimization to determine a suitable polishing pressure, removal rate, and percent by volume of hydrogen peroxide to achieve the polishing and the rinsing steps of Kishii et al.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no description in the specification as originally filed of the use of hydrogen peroxide only. There is only seen support for hydrogen peroxide and nitric acid (Page 8, lines 1-2), and hydrogen peroxide and deionized water (Page 8, lines 15-19).

(11) *Response to Argument*

Appellant argues that Kishii et al does not disclose rinsing the surface of a metal plug, and rinsing with an agent comprising hydrogen peroxide. However, Kishii et al teaches rinsing the surface of a plug 44b, and rinsing with an agent comprising hydrogen peroxide (Column 13, lines 63-66, and Column 14, lines 49-59).

Appellant argues that Kishii et al does not disclose introducing a rinsing solution comprising hydrogen peroxide onto a conductive plug. However, Kishii et al teaches

introducing a rinsing solution comprising hydrogen peroxide onto a conductive plug 44b (Column 13, lines 63-66, and Column 14, lines 49-59).

Appellant argues that “rinsing” and “cleaning” are not synonymous. However, as submitted by appellant’s in the instant appeal brief, Exhibits A, B and C, “cleaning” means “process of removing contaminants (particles as well as metallic and organic) from the surface of the wafer; can be implemented using chemicals (wet cleaning) of gases (dry cleaning)”, and “rinsing” means “process in which wafer is immersed in deionized water in order to stop chemical reactions initiated during preceding operation and to remove products of these reactions from the surface”, and “the removal of cleaning solutions, etchants or developers etc. from the wafer using water”. Therefore, rinsing and cleaning are synonymous since both terms are processes including removal of contaminants, products of reactions of prior operations, and etchants or developers from a surface of a wafer.

Appellant argues that Kishii et al does not anticipate rinsing. However, as stated above, Kishii et al does anticipate rinsing, since Kishii et al discloses removal of any residual abrasives in the substrate with a solution containing hydrogen peroxide (Column 14, lines 49-59). Therefore, recitation of rinsing encompasses the process of Kishii et al discussed above.

There is no description in the specification as originally filed of use of an “agent” or “solution” “consisting of” hydrogen peroxide. Hydrogen peroxide is a solid at room temperature and there is no support for use of molten H₂O₂. There is only seen support for aqueous solution of H₂O₂ and deionized water. Appellant argues that disclosure of solutions comprising H₂O₂ provides support for “agents” or “solutions” consisting of H₂O₂. However, water is not disclosed as an “alternative element” in the “agent” or “solution” (In re Johnson, 558 F.2d 1008, 1019, 194 USPQ 187,196 (CCPA 1977)) (MPEP 2173.05(i)).

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,



JAG

August 28, 2002

Conferees

Arthur Grimley Art Unit: 2852 ^M
Wael Fahmy Art Unit: 2823
Joannie García Art Unit: 2823



LONG PHAM
PRIMARY EXAMINER

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CALIFORNIA 90025